

REMARKS

Claims 1-4, 6, 7, 10 and 11 have been examined. With this amendment, Applicants cancel claim 11 and add claims 12-14. Claims 1-4, 6, 7, 10 and 12-14 are all the claims pending in the application. No new matter has been added.

Support for the amendments to claim 1 can be found at least at page 7, lines 16-17 and Table 3, Examples 4-7 of the Specification. Support for newly added claims can be found as follows:

Claim 12--at least at page 7, lines 29-32,

Claim 13 -- at least at page 9, lines 12-16, and

Claim 14-- at least from claims 1, 3, 12 and 13.

I. Claim Rejections - 35 U.S.C. § 102

The Examiner has rejected claims 1-3, 6, 7, 10 and 11 under 35 U.S.C. § 102(a) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Japanese Publication (2000-051397) [JP '397]. For at least the following reasons, Applicants traverse the rejection.

Claim 1 recites a multi-piece solid golf ball that has the following five subject-matters (A) to (D).

(A) A multi-piece solid golf ball comprising a solid core of at least one layer, an intermediate layer enclosing the solid core, and a cover enclosing the intermediate layer, wherein

(B) *1 said intermediate layer has a gage G₁ of 0.8 to 1.5 mm and a Shore D hardness of 50 to 65 and *2 said cover has a gage G₂ of 0.5 to 1.3 mm and a Shore D hardness of 37 to 50 and is formed of an urethane resin,

(C) and the gage G₁ of said intermediate layer and the gage G₂ of said cover satisfy *3
67.9% ≥ [G₁/(G₁+G₂)] × 100 ≥ 51.7%, and

(D) said hardness of said intermediate layer is higher than said hardness of said cover.

An object of the present invention is to provide a multi-piece solid golf ball which travels an increased distance upon full shots with a driver. An experiment was made on three-piece solid golf balls having a solid core, an intermediate layer, and a cover. The gages of the intermediate layers and covers were varied. The balls were hit with a driver at a head speed of 50 m/sec. In the graph of FIG 1 of the present specification, the initial velocity at which the ball is launched is plotted as a function of the intermediate layer gage for golf balls with different cover gages. The inventors found that (1) for an intermediate layer gage in the range of 2.0 to 1.2 mm, the ball rebound characteristics improve as the combined gage of intermediate layer and the cover becomes smaller and that (2) when the intermediate layer gage is below 1.2 mm, the rebound of the ball declines because the force binding the intermediate layer to the solid core is reduced. From these findings, the inventors found that the rebound reaches a maximum or critical point when the intermediate layer has a gage of about 1.2 mm (as depicted by an arrow in FIG 1).

With respect to item (*1) of subject-matter (B) given above, one can see from FIG 1 that the range of 0.8 to 1.5 mm of the gage G₁ of the intermediate layer is a preferable range with a

central point being 1.2 mm. In addition, one can see that item (*2) of subject-matter (B) is also supported by at least FIG 1, i.e., the G₂ gage range of 0.5 to 1.3 mm (□ cover gage 0.85 mm, O cover gage 1.20 mm).

In contrast, JP '397 merely discloses that the intermediate layer made of ionomer resins has a thickness of 0.8 to 3.5 mm (the alleged G₁) and the cover has a thickness of 0.5 to 2.5 mm (the alleged G₂). The Examiner contends that it would have been obvious in view of JP '397 to one having ordinary skill in the art to select the appropriate G₁ and G₂ values in the above range to satisfy the claimed formula thru routine optimization. Applicants disagree.

In the present invention as set forth in claim 1, the specific ranges of the intermediate layer gage and the cover gage and the relationship between the gages (claimed formula) ensure an advantageous combination of the intermediate layer gage with the cover gage. With this advantageous combination, the golf ball will travel an increased distance upon full shots with a driver. JP '397 fails to disclose or teach the claimed golf ball of claim 1, which has the combination of the specific ranges of the intermediate layer gage and the cover gage. In addition, JP '397 fails to disclose or teach the claimed formula ($67.9\% \geq [G_1/(G_1+G_2)] \times 100 \geq 51.7\%$), which is a comparatively narrow range, of item (*3) of subject-matter (C).

Applicants submit that the specific claimed ranges of the intermediate layer gage and the cover gage and the relationship represented by the claimed formula is patentably different when compared to the golf balls disclosed by JP '397, especially in view of the flight performance, please see Table 3 of the present specification. From Table 3, one can see that Examples 1-2, which do not satisfy the claimed formula, are sufficiently inferior to Examples 3-6, which are

consistent with the claimed invention, in total flight distance for both W#1/HS=45 and W#1/HS=50.

However, merely satisfying the claimed formula would not produce the advantages of the present invention as set forth in claim 1. For example, Examples 7-8, which satisfy the claimed formula, do not satisfy the claimed gage range G_1 of 0.8 to 1.5 mm for the intermediate layer. As one can see from Table 3, Examples 7-8 are sufficiently inferior to Examples 3-6, which are consistent with the claimed invention, in both total flight distances.

Therefore, since JP ‘397 does not provide any teaching or suggestion with respect to improving flight performance by selecting thicknesses for the intermediate layer and the cover that are within the claimed gage ranges, respectively, and also consistent with the claimed formula, the Examiner’s contention that the claimed gage ranges and the claimed formula are mere optimizations is unsupported. Accordingly, Applicant submit that the claimed features are not anticipated or made obvious by JP ‘397.

Further, as set forth in claim 1, the Shore D hardness of the claimed intermediate layer is 50 to 65 and the Shore D hardness of the claimed cover is 37 to 50, subject-matter (B) above, and the hardness of the intermediate layer is higher than the hardness of said cover, subject-matter (D). In contrast, JP ‘397 merely discloses that the Shore D hardness of the intermediate layer is 45 to 70 (paragraph 0034) and the Shore D hardness of the cover is 45 to 70 (paragraph 0041). These sections do not disclose or suggest that the hardness of the intermediate layer is higher than the hardness of the cover. Accordingly, claim 1 is patentable for this additional reason.

Because claims 2, 3, 6, 7 and 10 depend on claim 1, Applicants submit that these claims are patentable at least by virtue of their dependency.

Applicants have canceled claim 11.

II. Claim Rejections - 35 U.S.C. § 103(a)

The Examiner has rejected claim 4 under 35 U.S.C. § 103(a) as being unpatentable over JP '397. For at least the following reason, Applicants traverse the rejection.

Applicants submit that claim 4 is patentable at least by virtue of its dependency on claim 1.

III. New Claims

With this amendment, Applicants add claims 12-14. Applicants submit that claims 12 and 13 are patentable at least by virtue of their dependency on claim 1, as well as the features set forth therein.

Because claim 14 recites features similar to those given above with respect to claim 1, Applicants submit that claim 14 is patentable for at least reasons similar to those given above with respect to claim 1.

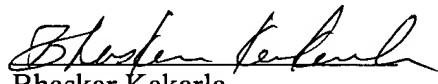
In addition, claim 14 recites that the “solid core, a spherical body obtained by enclosing the core with the intermediate layer and a spherical body obtained by enclosing the intermediate layer with the cover undergo a deflection of 3 to 4.5 mm, 2.8 to 6.0 mm and 2.5 to 4.0 mm under an applied load of 100 kg, respectively.” Applicants submit that JP '397 does not disclose or suggest this feature. Therefore, claim 14 is patentable for this additional reason.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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